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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,834	03/09/2004	Svein Brekke	130394UL	2461

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Dean D. Small
Armstrong Teasdale LLP
Suite 2600
One Metropolitan Square
St. Louis, MO 63102

EXAMINER

JAWORSKI, FRANCIS J

ART UNIT	PAPER NUMBER
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3768

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/796,834

Applicant(s)

BREKKE ET AL.

Examiner

Jaworski Francis J.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2006.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 and 50-55 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
5) ☐ Claim(s) ____ is/are allowed.
6) ☒ Claim(s) 1-47, 50-55 is/are rejected.
7) ☐ Claim(s) ____ is/are objected to.
8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: ____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 – 2, 4, 6 - 8, 10 –13, 16 - 17, 19 – 30, 32, 34 – 35, 37 – 47, 50 – 52 and 55 as amended are rejected under 35 U.S.C. 102(b) as obvious over Brekke et al (2002 IEEEUTS SYMP PROC> pp. 1593-96, of record with the 3/9/04 IDS filing) in view of Hossack et al (US6014473) or Seward et al (US5704361) or Clifton et al (US3813654).

Brekke et al as earlier noted teaches, prior to applicants' critical date, a trigger extraction apparatus and method and stored algorithm for operating a subsystem for a 3D ultrasound imaging system and 2D or 1.5D probe which system uses in-phase and

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quadrature phase tissue Doppler data from looped recording playback and derived from elevational beamformer defocusing about the B-scan tissue image plane for fixed 4-chamber fetal heart tissue view in an algorithm in which the autocorrelation lag 1 average or mean value of Doppler amplitude across the heart image is computed and minima extracted with option of use of positive extremum value alternative, and/or interpolative additional trigger computations per Fig. 2 to provide plural such triggers as well as delayed triggers per Fig. 3, which event triggers are stored for slow-speed comparison playbacks. Since implementation of such an algorithm defined in $R1$, r , θ and t and across all points of an image for 1,950 such stored image frames would be impossible without storage of the algorithm and association with a processor during its running which is also the case for application of EchoPAC3D view reconstruction software for the general imaging system which acts in cooperation with the algorithm software as described for synchronous viewing of the triggering curve and the synchronized rendered images, the listed claims are therefore met save for the use of azimuthal focusing, however it was heretofore known in the art to azimuthally de-focus:

In the case of Seward et al it was known to defocus in elevation and azimuth in order to expand the general viewing volume of a small internal point source array, see col. 14 lines 45 – 57; in the case of Hossack et al such was used in order to keep targeting in the face of object motion in general, see col. 16 lines 54 – 57, and in the case of Clifton et al it was known to do so in order to track the fetal heartbeat remote from the transducer support surface as the fetus moved, an application likenable to the Brekke et al case, lens defocusing being understood by the artisan to be an equivalent to the electronic case.

Claims 1 – 2, 4, 6 – 8, 10 – 13, 16 – 17, 19 – 30, 32, 34 – 35, 37 – 47, 50 – 52 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brekke et al in view of Seward et al/Hossack et al/Clifton et al, further view of Omiya (US6849048),

alone or further In view of Jackson (US6673017). If the former be considered to be lacking with respect to feature extraction and transfer into storage, it would have been obvious in view of Omiya to provide software resident on a CD-ROM in 104 to implement by interfacing within processor 100 with display formatting software 102 to provide synchronization 106 for display by using a characteristic waveform such as LVV derived from an overlapping (ventricular wall subregion) of the cardiac image. Alternatively, if Omiya be viewed as revealing of the literal stored software and processor-software interactions to synchronize a tomographic image but itself be deficient regarding a Doppler basis for the characterizing waveform, then it would have been nonetheless been obvious to to use e.g. mean doppler velocity based upon autocorrelation determinations to provide a characterizing temporal wavetrace upon which to perform image registry.

[Alternately re-stated the Examiner's position is that, to the extent that Brekke et al lacks complete fleshing out of the processor-software interaction and storage of feature event extraction processes, one skilled in the art and also having before him Omiya directed to the registration of tomographic cardiac images and Doppler images (not Doppler based triggers) where ECG or other external synchronism is not suitable or available and teaching the alternative of an image-derived characterizing temporal reference and Jackson et al directed to registration of single B-modality ultrasound heart images but across plural heart cycles for high fidelity strain rate imaging or valve motion study and teaching that for image-derived temporal waveform purposes a B-mode index (as defined col. 5 lines 26 – 30) is likenable to a Doppler image –derived

index (as defined col. 6 lines 22 – 51) , that artisan would understand to flesh out Brekke et al with the latter patent teachings. Otherwise the applicability of Seward et al/Hossack et al/Clifton et al is as stated above.]

Claims 3, 5, 9, 14-15, 18, 31, 33, 36 and 53 - 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brekke et al in view of Seward et al/Hossack et al/Clifton et al considered alone, or further in view of Omiya alone or with Jackson in supplement as applied to claims 1, 4, 8, 12, 30 above, and further in view of (a) linuma et al (US5785654) or (b) Yamazaki et al (US5513640), or (c) Moehring et al (US2005/0033174). Whereas the Brekke et al article does not address high-pass filtering, it would none the less have been obvious in view of linuma et al col. 7 lines 7 – 38 to set a high pass filter on phase-detected Doppler data since if one wishes to track valve motion or bloodflow then lower frequency tissue motion must be filtered, or it would have been obvious in view of linuma et al col. 4 lines 32 – 62 to eliminate very low velocity movement since fixed locational change i.e. aggregate macro movement of the heart should be filter eliminated to derive net valve motion, or it would have been obvious in view of Moehring et al para [0037] to set a high-pass filter in application-specific fashion so as to eliminate bruits for example from Doppler flow data.

[Alternately stated, the Examiner is interpreting applicants' para [0028] to mean that the data set on which trigger extraction may be practiced can be either Doppler tissue velocity/TVI or bloodflow data (as might be advantageous in a contrast agent application for example) or para [0032] lines 5 – 10 might mean that the digital

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regression filter is set in a data dependent fashion (for example a maternal bruit might be confounding), and so multiple prior art items are applied, the net being that it would not appear that the high pass feature creates patentable distinction over Brekke et al.]

Response to Arguments

Applicants arguments that the prior art would not teach azimuthal de-focussing in association with triggering arte not well-taken to the extent that the applied secondary teachings evidence that a certain amount of such de-focussing was known to be practiced in association with tracking motion and/or to compensate for targeting remote from the source transducer (array) location, both of which circumstances are present in the Brekke et al case.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

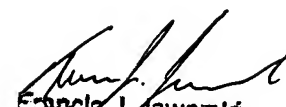
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Any inquiry concerning this communication should be directed to Jaworski
Francis J. at telephone number 571-272-4738.

FJJ:fjj

11-12-06


Francis J. Jaworski
Primary Examiner